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Algebra II Delta & Eta

Test First Half Unit III - PRACTICE
Radical, Exponentials, & Equations with Radicals
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Name:

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Solutions

1. Simplify $3x^2 + 5x^2 = 8x^2$

2. Simplify $4x^3 + 6x^3 + 2x^2$

$10x^3 + 2x^2$

3. Simplify $(3x^2)(5x^2) = 15x^4$

4. Simplify $(4x^3)(6x^3)(2x^2)$

$(24x^6)(2x^2)$
 $48x^8$

5. Simplify $3 \cdot 3^2 \cdot 3^3 = 3^6 = 729$

6. Simplify $3^x \cdot 3^y = 3^{x+y}$

$$\begin{array}{r} 27 \\ 27 \\ \hline 189 \\ 540 \\ \hline 729 \end{array}$$

7. True or False: $x^4 \cdot y^4 = (xy)^4$

Very True

8. Simplify $a^2b^3 + 7a^2b^3 = 8a^2b^3$

9. Simplify $a^2b^3 \cdot 7a^2b^3$

$7a^4b^6$

10. Simplify $(a^2)^5 = a^{10}$

11. Simplify $(a^3)^2 + (a^2)^3$

$a^6 + a^6$
 $2a^6$

12. Simplify $(a^3b^4)^5 = a^{15}b^{20}$

13. Simplify $(2a^2b^3)^3 = 2^3a^6b^9$ $= 8a^6b^9$	14. Simplify $(4a^3b^4)^2 \cdot (2ab^2)^3$ $4^2a^6b^8 \cdot 2^3a^3b^6$ $16a^6b^8 \cdot 8a^3b^6$ $128a^9b^{14}$
15. Simplify $4r^5 \cdot 2r^{-2} = 8r^3$	16. Simplify $2r^3p^{-3} \cdot 4r^{-1}p^3 = 8r^2p^0$ $= 8r^2$
17. Simplify $(4m^5n^6)^1 = 4m^5n^6$	18. Simplify $(4m^5n^6)^0 = 1$
19. Simplify $x^{-1} = \frac{1}{x}$	20. Simplify $(2k)^{-1} = \frac{1}{2k}$
21. Simplify $(5k)^{-2} = \frac{1}{(5k)^2} = \frac{1}{25k^2}$	22. Simplify $(5k^{-1})^{-2} = 5^{-2}k^2$ $= \frac{k^2}{5^2}$ $= \frac{k^2}{25}$
23. Simplify $(5^{-1}k)^{-2} = 5^2k^{-2}$ $= \frac{25}{k^2}$	24. Simplify $\frac{y^5}{y^2} = y^3$

25. Simplify $\frac{y^3}{y^8} = \frac{1}{y^5}$	26. Simplify $\frac{36n^6}{3n} = 12n^5$
27. Simplify $\frac{14n^{-2}}{42n} = \frac{n^{-2}}{3n} = \frac{1}{3nn^2} = \frac{1}{3n^3}$	28. Simplify $\frac{14n}{42n^{-2}} = \frac{n}{3n^{-2}} = \frac{nn^2}{3} = \frac{n^3}{3}$
29. Simplify $\frac{17n^{-3}}{51n^{-6}} = \frac{n^{-3}}{3n^{-6}} = \frac{n^{-3}n^6}{3} = \frac{n^3}{3}$	30. Simplify $\frac{17n^{-6}}{51n^{-3}} = \frac{n^{-6}}{3n^{-3}} = \frac{1}{3n^{-3}n^6} = \frac{1}{3n^3}$
31. Simplify $\frac{8m^4n^3p^3}{2m^2n^2p^4} = \frac{4m^2n}{p^2}$	32. Simplify $\frac{8^7}{8^6} + \frac{8^3}{8^4} = 8 + \frac{1}{8} = 8\frac{1}{8}$
33. Simplify $\sqrt{2} \cdot \sqrt{32} = \sqrt{64} = 8$	34. Simplify $\sqrt{-2} \cdot \sqrt{32}$ undefined
35. Simplify $\sqrt{5} \cdot \sqrt{10} = \sqrt{50} = \sqrt{25 \cdot 2} = 5\sqrt{2}$	36. Simplify $\sqrt{14} \cdot \sqrt{7} = \sqrt{14 \cdot 7} = \sqrt{2 \cdot 7 \cdot 7} = \sqrt{2 \cdot 49} = 7\sqrt{2}$

<p>37. Simplify $\sqrt[3]{4} \cdot \sqrt[3]{16} = \sqrt[3]{64}$ $= 4$</p>	<p>38. Simplify $\sqrt{72t^3} = \sqrt{36 \cdot 2 t^2 \cdot t}$ $= 6t\sqrt{2t}$</p>
<p>39. Simplify $\sqrt{150f^5} = \sqrt{25 \cdot 6 f^4 \cdot f}$ $= 5f^2\sqrt{6f}$</p>	<p>40. Simplify $\sqrt[3]{27y^6} = 3y^2$</p>
<p>41. Simplify $\sqrt[3]{-54y^8} = \sqrt[3]{-2 \cdot 27 y^6 y^2}$ $= -3y^2\sqrt[3]{2y^2}$</p>	<p>42. Simplify $\sqrt{7x^5y} \cdot \sqrt{42x^2y^8}$ $\sqrt{7 \cdot 6 \cdot 7 x^7 y^9}$ $\sqrt{49 \cdot 6 x^6 y^8 y}$ $7x^3y^4\sqrt{6xy}$</p>
<p>43. Simplify $\frac{\sqrt{25}}{\sqrt{36}} = \frac{5}{6}$</p>	<p>44. Simplify $\frac{\sqrt{175}}{\sqrt{7}} = \sqrt{25} = 5$</p>
<p>45. Simplify $\frac{-\sqrt[3]{135r^7}}{\sqrt[3]{-5r^4}} = \sqrt[3]{\frac{135r^7}{-5r^4}}$ $= \sqrt[3]{-27r^3} = -3r$</p>	<p>46. Simplify $\sqrt{175} \cdot \sqrt{121} = \sqrt{175 \cdot 121}$ $= 11\sqrt{175} = 11\sqrt{25 \cdot 7}$ $= 11 \cdot 5\sqrt{7}$ $= 55\sqrt{7}$</p>
<p>47. Simplify $\sqrt{600} \cdot \sqrt{144}$ $\sqrt{100 \cdot 6} \cdot 12 = 10\sqrt{6} \cdot 12 = 120\sqrt{6}$</p>	<p>48. Simplify $\sqrt{11} + 3\sqrt{11} - 4\sqrt{22}$ $4\sqrt{11} - 4\sqrt{22}$</p>

<p>49. Simplify $\sqrt{72} + 3\sqrt{32} - 4\sqrt{18} =$ $= \sqrt{36 \cdot 2} + 3\sqrt{16 \cdot 2} - 4\sqrt{9 \cdot 2}$ $= 6\sqrt{2} + 3 \cdot 4\sqrt{2} - 4 \cdot 3\sqrt{2}$ $= 6\sqrt{2} + 12\sqrt{2} - 12\sqrt{2}$ $\quad \quad \quad 6\sqrt{2}$</p>	<p>50. Simplify $\sqrt{3}(4 + \sqrt{3}) =$ $= 4\sqrt{3} + \sqrt{9}$ $= 4\sqrt{3} + 3$</p>
<p>51. Simplify $(5 + \sqrt{3})(5 - \sqrt{3}) =$ $= 25 - 5\sqrt{3} + 5\sqrt{3} - \sqrt{9}$ $= 25 - 3$ $= 22$</p>	<p>52. Simplify $(3 + \sqrt{10})(4 + \sqrt{10}) =$ $= 12 + 3\sqrt{10} + 4\sqrt{10} + \sqrt{100}$ $= 12 + 7\sqrt{10} + 10$ $= 22 + 7\sqrt{10}$</p>
<p>53. Simplify $\sqrt{-81}$ undefined</p>	<p>54. Simplify $\sqrt[3]{-81} = \sqrt[3]{-27 \cdot 3}$ $= -3\sqrt[3]{3}$</p>
<p>55. Simplify $\sqrt{28x^3y} = \sqrt{4 \cdot 7x^2 \cdot xy}$ $= 2x\sqrt{7xy}$</p>	<p>56. Write \sqrt{x} in exponential form $= x^{\frac{1}{2}}$</p>
<p>57. Write $x^{\frac{3}{2}}$ in simplified radical form $= (x^{\frac{1}{2}})^3 = (\sqrt{x})^3$ $= (x^{\frac{1}{2}})^{\frac{6}{2}} = \sqrt{x^3} = \sqrt{x^2 \cdot x} = x\sqrt{x}$</p>	<p>58. Write $\sqrt[3]{5y^4}$ in exponential form $= (5y^4)^{\frac{1}{3}} = 5^{\frac{1}{3}}y^{\frac{4}{3}}$</p>
<p>59. Simplify $(24x)^{\frac{1}{2}} \cdot (6x^5y)^{\frac{1}{2}} =$ $= \sqrt{24x} \cdot \sqrt{6x^5y} = \sqrt{24 \cdot 6x^6y}$ $= \sqrt{4 \cdot 6 \cdot 6x^6y} = 2 \cdot 6x^3\sqrt{y}$ $= 12x^3\sqrt{y}$</p>	<p>60. Simplify $(27y^6)^{\frac{4}{3}} = 27^{\frac{4}{3}}y^8$ $= (27^{\frac{1}{3}})^4y^8 = 3^4y^8 = 81y^8$</p>

<p>61. Simplify $6\sqrt{13} + 3\sqrt{15} + 4\sqrt{13} + \sqrt{15} =$</p> $= 10\sqrt{13} + 4\sqrt{15}$	<p>62. Simplify $5\sqrt{18} + 2\sqrt{128} - 3\sqrt{32} =$</p> $= 5\sqrt{9 \cdot 2} + 2\sqrt{64 \cdot 2} - 3\sqrt{16 \cdot 2}$ $= 5 \cdot 3\sqrt{2} + 2 \cdot 8\sqrt{2} - 3 \cdot 4\sqrt{2}$ $= 15\sqrt{2} + 16\sqrt{2} - 12\sqrt{2}$ $= 19\sqrt{2}$
<p>63. Simplify $3\sqrt{7x^3} \cdot 2\sqrt{14x^2} =$</p> $= 6\sqrt{7 \cdot 14 x^5} = 6\sqrt{7 \cdot 7 \cdot 2 x^4 x}$ $= 6 \cdot 7 x^2 \sqrt{2x} = 42x^2 \sqrt{2x}$	<p>64. Simplify $2\sqrt{18} \cdot 4\sqrt{12} =$</p> $= 8\sqrt{18 \cdot 12} = 8\sqrt{9 \cdot 2 \cdot 4 \cdot 3}$ $= 8\sqrt{36 \cdot 6} = 8 \cdot 6\sqrt{6} = 48\sqrt{6}$
<p>65. Solve $\sqrt{m} = 10$</p> $m = 100$	<p>66. Solve $\sqrt{3x} = 9$</p> $\sqrt{81} = 9 \quad 3x = 81$ $x = 27$
<p>67. Solve $\sqrt{k-10} = 6$</p> $\sqrt{36} = 6 \quad k-10 = 36$ $k = 46$	<p>68. Solve $\sqrt{2x-7} = 5$</p> $\sqrt{25} = 5 \quad 2x-7 = 25$ $2x = 32$ $x = 16$
<p>69. Solve $\sqrt{9-y} = \sqrt{1-9y}$</p> $9-y = 1-9y$ $9+8y = 1$ $8y = -8$ $y = -1$	<p>70. Solve $(2x+14)^{\frac{1}{2}} = 8$</p> $\sqrt{2x+14} = 8$ $\sqrt{64} = 8$ $2x+14 = 64$ $2x = 50$ $x = 25$